

This file provides information about the Segmented Echo Planar (EPI_SEG) image sets in the B1_Correction QIBA series (version 13).

This data set is similar to version 5, except that it simulates B1 inhomogeneity correction.

There are several different schemes used to correct for B1 inhomogeneity. We simulate two double-angle correction schemes: (60-120 and 120-240) and (60-180 and 120-180). The output of these images is the B1 correction images. Four sets of T1 Mapping and dynamic images were made by adjusting the nominal flip angle by $\pm 10\%$ and $\pm 20\%$ to give the actual flip angle.

Two sets of images are provided for each series. DICOM part 10 format images are in the DICOM directory. XML files are in the XML directory. The XML images allow the values for the DICOM tags to be altered using a text editor, and new DICOM images can then be generated using dcm4che's tool called "xml2dcm," available at <http://www.dcm4che.org/confluence/display/d2/dcm4che2+DICOM+Toolkit>.

The fixed parameters used to generate the data are:

Repetition Time = 5 msec
Assumed T1 (in tissue) = 1000 msec
Assumed equilibrium magnetization (in tissue) = 50000
Assumed T1 (in blood vessel) = 1440 msec
Assumed equilibrium magnetization (in blood vessel) = 50000

The correction factors used are {0.8, 0.9, 1.1, 1.2} (i.e. {-20%, -10%, +10%, +20%}).

The EPI_SEG images were generated using the formula

$$S = S_0 \cdot \sin(ka) \cdot \sin^2\left(\frac{kb}{2}\right)$$

where S is signal intensity, S_0 is the assumed equilibrium magnetization, k is the correction factor, a is the first angle in the double angle method (in degrees), and b is the second angle in the double angle method (in degrees).

The data sets are organized as follows: Each correction factor is in its own folder, with the dynamic, T1 Mapping, and EPI_SEG images contained in subfolders within these correction factor folders. The naming convention for the correction factor folders is "B1_Correction_<CF>Percent_<Creation date>" where <CF> is the correction factor and <Creation date> is the date when the images were created. Thus, the folder "B1_Correction_+10Percent_20150721" has a correction factor of +10% (1.1) and was created on July 21, 2015.

The folders with the EPI_SEG images are titled "EPI_SEG_<a>__<Creation date>", where <a> is the first angle, is the second angle, and <Creation date> is the date when the images were created. Thus, the folder "EPI_SEG_60_120_20150721" has a first angle of 60 degrees, a second angle of 120 degrees, and was created on July 21, 2015.